

國立清華大學工程與系統科學系

博士班資格考試辦法

Department of Engineering and System Science, National Tsing Hua University

PhD Qualification Exam Rules

100 年 12 月 28 日系務會議修正
101 年 2 月 22 日系務會議修正
101 年 11 月 28 日系務會議修正
101 年 12 月 26 日系務會議修正
103 年 3 月 26 日系務會議修正
104 年 8 月 26 日系務會議修正
104 年 9 月 30 日系務會議修正
105 年 11 月 8 日系務會議修正
110 年 3 月 17 日系務會議修正
112 年 8 月 30 日系務會議修正

第一條 博士班資格考試選考科目如下：

- 1.核工原理、輻射度量、工程熱力學、熱流學、流體力學、奈微米系統工程原理、奈米科技進階、計算材料科學、物理冶金、材料熱力學、固態物理導論、物理化學、電化學原理、近代物理、量子力學、電漿工程、電磁學、半導體元件物理、電路學、電子元件、訊號與系統、機率與統計。
2. 參考用書及範圍，請參考系網頁公佈之內容。

1. The subjects covered in the PhD Qualification Exam include:

Principles of Nuclear Engineering、Nuclear Radiation Measurement、Engineering Thermodynamics、Heat Transfer、Fluid Mechanics、Principles of Microsystem Engineering、Advanced Nanotechnology、Computational Materials Science、Physical Metallurgy、Thermodynamics of Materials、Introduction to Solid State Physics、Physical Chemistry、Principles of Electrochemistry、Modern Physics、Quantum Mechanics、Plasma Engineering、Electromagnetics、Semiconductor Devices Physics、Electric Circuits、Electronic Devices、Signals and Systems、Probability and Statistics
Refer to the Department website for reference books and scopes.

<p>第二條 學生應自上述科目選考其中二科，且繳交考試申請單。一旦向系辦公室登記參加，便不可以要求退出，如未參加考試，便以零分計。</p>	<p>2. All students are required to take 2 subjects listed above as their exam subjects and register the Qualification Exam by handing in the exam application form. Once completing the registration, students cannot cancel the exam. Students absent from the exam will get a score of 0.</p>
<p>第三條 資格考試各科通過成績不得低於七十分，學生對成績有疑議者，可於成績公告後一週內，書面提出複查申請送交系辦。系上收到申請後，調閱試卷送交命題老師再次審閱並回覆結果，最後將複查結果書面通知學生。</p>	<p>3. The minimum requirement of score for each subject in the Qualification Exam is 70 out of 100. If students have any doubt about their scores, they can apply for score review within one week after the exam results are announced. Once the department receives the application, the answer sheets of the applicant will be reviewed by examiners. After receiving the review results, the department announces the result of review to the applicant.</p>
<p>第四條 擬參加資格考試的學期，務必要註冊。休學中不可以參加資格考試。</p>	<p>4. Students who plan to attend the Qualification Exam must enroll themselves in the semester. Students cannot attend the Qualification Exam during suspension of school.</p>
<p>第五條 學生可申請以修習特定課程（請見第 8 條規定）抵免資格考試科目。流程如下：需於每學期開學加選截止日前提出申請，至多登記兩門當學期所修習課程為擬抵免科目，一旦登記之後就不可以變動。學期末所登記課程的學期成績達 A- 以上(含)，則該課程通過抵免申請。</p>	<p>5. Students can apply for exempting from the Qualification Exam by taking specific courses (see Rule 8). The procedure is as follows:</p> <ol style="list-style-type: none"> (1) Apply for the exemption before the deadline of the course add-and-drop period of the semester. Register maximum two specific courses to be taken in the semester for the exemption. (2) Once registered, the courses cannot be altered. (3) A registered course passes the exemption application if the score is equal or higher than A-.

<p>第六條 入學前5年內(特殊情況可提例外申請)已修習過可抵免資格考試的科目(成績需達A-以上(含)),可於入學時提出直接抵免申請。提出此申請的時程比照學校入學學分抵免申請時程,逾期不予辦理。</p>	<p>6. The specific courses, taken within the past 5 years (exceptional allowed under special circumstances) before entering the Ph.D. program, with a minimum score A- can be applied for the exemption. But the application must be done at the same moment for the credit transferring application. Late application is not accepted.</p>
<p>第七條 入學後至多只能提出兩次資格考試申請。以修課抵免資格考試申請則無次數限制。學生需於入學後二年內(休學不計入年限)合計完成通過兩門科目的要求,未符合此規定者,應予退學。</p>	<p>7. Students can register for Qualification Exam, at most two times, after entering to the Ph.D. program. There is no number limit for the registration of exemption application. Students have to totally pass two subjects (the exam subjects plus the courses of exemption) within 2 years after the enrollment of the program (not including suspended year). Students who failed to achieve this requirement are dropped out.</p>
<p>第八條 選考科目與以修課抵免資格考試之關係,請見附表一。修課的科號及科目名稱需與表中資訊完全一致。</p>	<p>8. The correspondence between the exam subjects and the specific courses to exempt the exam is given in Table 1. Both the course title and the course ID must be strictly respected in an exemption application.</p>
<p>第九條 本辦法經系務會議通過後實施,修正時亦同。</p>	<p>9. The rules come in force after approved in Departmental Affairs Meeting, likewise for revision of the rules</p>

附表一：選考科目與以修課抵免資格考試關係表

Table 1: The corresponding table between the exam subjects and the specific courses to exempt the exam

編號 No.	選考科目 exam subjects	以修課抵免資格考試 (修課科號、科目名) specific courses to exempt the exam (course ID and title)
1	核工原理 Principles of Nuclear Engineering	ESS5110/NES5010 反應器物理一 (ESS5110/NES5010) Reactor Physics I
2	輻射度量 Nuclear Radiation Measurement	NES 5211 輻射度量 (NES 5211) Radiation Detection and Measurement
3	工程熱力學 Engineering Thermodynamics	ESS5410/NES5410 反應器工程 (ESS5410/NES5410) Nuclear Reactor Engineering
4	熱流學 Heat Transfer	ESS 5490 計算熱流學 (ESS 5490) Computational Fluid Dynamics and Heat Transfer
5	流體力學 Fluid Mechanics	ESS6430 雙相流與沸騰熱傳 (ESS6430) Two-Phase Flow & Boiling Heat Transfer
6	奈微米系統工程原理 Principles of Microsystem Engineering	ESS5850 微系統設計 (ESS5850) Micro System Design
7	奈米科技進階 Advanced Nanotechnology	TIGP7402 奈米科技進階 (TIGP7402) Advanced Nanotechnology
8	計算材料科學 Computational Materials Science	TIGP7483 計算材料 (TIGP7483) Computational Materials Science
9	物理冶金 Physical Metallurgy	ESS5520 高等物理冶金 (ESS5520) Advanced Physical Metallurgy
10	材料熱力學 Thermodynamics of Materials	ESS5505 固態熱力學 (ESS5505) Thermodynamics of Solid State
11	固態物理導論 Introduction to Solid State Physics	ESS5390 / TIGP7441 固態物理一 (ESS5390/TIGP7441) Solid State Physics I

編號 No.	選考科目 exam subjects	以修課抵免資格考試 (修課科號、科目名) specific courses to exempt the exam (course ID and title)
12	物理化學 Physical Chemistry	ESS5898 軟物質科學導論 或 TIGP7476 有機金屬化學 或 TIGP 7271 高等物理化學一 (3 選 1) (ESS5898) Introduction to Soft Condensed Matter or (TIGP7476) Organometallic Chemistry or (TIGP7271) Advanced Physical Chemistry (I) (Select one from three)
13	電化學原理 Principles of Electrochemistry	ESS5847 生化分析與實驗 (TIGP 奈米學程學生不可以此科目抵免 資格考筆試) 或 ESS5590 工程電化學 (2 選 1) (ESS5847) Bioanalytical Chemistry : Basic Principles and Lab Projects (TIGP Nano Program students are not eligible for this subject to exempt from the written qualification examination) or (ESS5590) Electrochemistry for Engineers (Select one from two)
14	近代物理 Modern Physics	ESS 5545 同調光及電子繞射顯微術或 ESS 5644 同步加速器 X 光吸收光譜分析應用 (2 選 1) (ESS 5545) Coherent X-ray and Electron Diffraction Microscopy or (ESS 5644) Applications of Synchrotron X-ray Absorption Spectroscopy (Select one from two)
15	量子力學 Quantum Mechanics	ESS5822 分子動力學模擬或 ESS 5585 第一原理材料計算 (2 選 1) (ESS5822) Molecular Dynamics Simulations or (ESS 5585) First-principles simulations of materials

編號 No.	選考科目 exam subjects	以修課抵免資格考試 (修課科號、科目名) specific courses to exempt the exam (course ID and title)
		(Select one from two)
16	電漿工程 Plasma Engineering	ESS5340 電漿工程應用 (ESS5340) Plasma Engineering and Applications
17	電磁學 Electromagnetics	ESS5271 微波工程 (ESS5271) Microwave Engineering
18	半導體元件物理 Semiconductor Devices Physics	ESS5230 半導體元件物理 (ESS5230) Semiconductor Devices Physics
19	電路學 Electric Circuits	無 N/A
20	電子元件 Electronic Devices	ESS52000 微電子工程 Microelectronic Engineering
21	訊號與系統 Signals and Systems	ESS 5267 高等系統與訊號分析 Advanced System and Signal Analysis
22	機率與統計 Probability and Statistics	無 N/A